TECHNICAL REVIEW DOCUMENT
For
MODIFICATION TO OPERATING PERMIT 04OPJE272

Plains End Generating Station
Jefferson County
Source ID 0590864

Prepared by Jacqueline Joyce
July 2011
Revised September and November 2011

I. Purpose:

This document establishes the decisions made regarding the requested modifications to the Operating Permit for the Plains End Generating Station. This document provides information describing the type of modification and the changes made to the permit as requested by the source and the changes made due to the Division's analysis. This document is designed for reference during review of the proposed permit by EPA and for future reference by the Division to aid in any additional permit modifications at this facility. The conclusions made in this report are based on the information provided in the original request for modification submitted to the Division on June 22, 2011, information submitted on September 2, 2010, comments on the draft permit and technical review document received via e-mail on August 16, September 14 and October 24, 2011, various e-mail correspondence and telephone conversations with the source. This narrative is intended only as an adjunct for the reviewer and has no legal standing.

Any revisions made to the underlying construction permits associated with this facility made in conjunction with the processing of this operating permit application have been reviewed in accordance with the requirements of Regulation No. 3, Part B, Construction Permits, and have been found to meet all applicable substantive and procedural requirements. This operating permit incorporates and shall be considered to be a combined construction/operating permit for any such revision, and the permittee shall be allowed to operate under the revised conditions upon issuance of this operating permit without applying for a revision to this permit or for an additional or revised construction permit.

II. Description of Permit Modification Request/Modification Type

The initial operating permit for this facility was issued on April 1, 2010. The equipment at this facility consists of thirty four (34) engines which are used to generate electricity. All of the engines are equipped with selective catalytic reduction (SCR) to reduce NO_X emissions. SCR works by converting NO_X into N_2 and H_2O. The process involves combining NO_2 with a reductant (in this case urea, which is converted to ammonia), which then comes into contact with the catalyst which aids the reaction. The source submitted a request on June 22, 2011 to modify the permit to address instances in

which urea is not being injected and to allow time to correct this situation. Performance testing has indicated that NO_X emissions from the engines are well below the RACT hourly limitations and as a result, compliance with the hourly NO_X RACT limit can be met if urea injection fails for short periods of time. The Division considered that this modification could be processed as a minor modification, using the procedures in Colorado Regulation No. 3, Part C, Section X. However, upon submittal of the application, it became clear that the permit requires the source to meet the hourly NO_X RACT limit at all times, including periods of startup and shutdown. Urea is not injected until the output of the engines reach a certain capacity and the catalyst inlet temperature reaches 572 ° F. The startup and shutdown periods are short in duration, and it is possible that the hourly NO_X RACT limit would not be exceeded if a startup or shutdown occurred within an hour. However, in a telephone conversation with the Division, the source requested that the permit be revised to indicate that the NO_X RACT limits (in lb/MMBtu) do not apply during periods of startup and shutdown.

The minor modification procedures in Colorado Regulation No. 3, Part C, Section X, cannot be used for changes to a case-by-case determination of an emissions limitation (see Colorado Regulation No. 3, Part C, Section X). Since the RACT limit is considered a case-by-case limit, the minor modification procedures cannot be used. Colorado Regulation No. 3, Part C, Section I.A.7 identifies those modifications that are considered significant modifications. A significant modification requires the full Title V permit review process (30 day public comment period and 45 day EPA review period) and the proposed modifications may not be instituted until the revised permit is issued. Specifically, significant modifications are “any change that requires or changes a case-by-case determination of an emission limitation or other standard” (Colorado Regulation No. 3, Part C, Section I.a.7.c). Since the modification requests relief from the RACT limit for periods of startup and shutdown, the Division considers that this modification must be processed as a significant modification.

III. Modeling

This modification does not warrant the revision of the modeling analyses that supports the construction permits issued for this facility. The projected changes in impacts are not expected to change the outcome of the original compliance demonstration (qualitative impact analysis). Thus a modeling analysis was not required.

IV. Discussion of Modifications Made

Source Requested Modifications

The Division addressed the source’s requested modifications as follows:

June 22, 2011 Application

During the first year of the permit term, the source noted several instances when the malfunction alarm indicated that there was no urea flow. While these instances have

greatly decreased, the source requested a modification to the permit to address instances where urea injection may not occur for very short periods of time. Performance tests have indicated that NO_X emissions from the engines are well below the RACT limit therefore, it is unlikely that the NO_X RACT limit would be exceeded during short periods of time where urea is not injected. The Division agreed that the permit could be revised to address these infrequent occurrences and indicated that the modification could be processed as a minor modification. Upon submittal of the application, it became apparent that periods of startup and shutdown must be addressed as these are periods when urea is not injected. Based on the discussions between the Division and the source, it was agreed that the permit would also be revised to clarify that the NO_X RACT limit does not apply during periods of startup and shutdown. The above changes were addressed in the permit as follows:

Section II.1 – Plains End I Engines (twenty (20) engines)

- Revised Condition 1.4.2 to indicate that the NO_X RACT limit does not apply during periods of startup and shutdown. In addition, definitions of startup and shutdown were included in this condition.

- A "new" Condition 1.8.2.1 was added to address urea injection to the SCR systems

Section II.2 – Plains End II Engines (fourteen (14) engines)

- Revised Condition 2.4.2 to indicate that the NO_X RACT limit does not apply during periods of startup and shutdown. In addition, definitions of startup and shutdown were included in this condition.

- A "new" Condition 2.8.2.1 was added to address urea injection to the SCR systems

September 2, 2010 Letter

The source submitted a letter on September 2, 2010 indicating changes to the responsible official. These changes are reflected in the revised permit.

Comments on the Draft Permit and Technical Review Document Received on August 16 and September 14, 2011

In their comments on the draft permit, Plains End requested that the permit be revised to require that HAP emissions be calculated for a smaller list of HAPS to monitor compliance with the facility wide HAP limits, rather than the full list included in Appendix G. Initially, the source requested and the Division considered that it was only necessary to calculate formaldehyde emissions, since formaldehyde is the significant HAP emitted by the equipment at this facility. However, after further review the Division considered that since potential to emit of HAPs (based on the emission factors in Appendix G of the permit and permitted fuel consumption limits) for a few pollutants exceeds the APEN reporting level that emissions should be calculated for those pollutants. As a result of this request, the following changes were made to the permit:

- Revised the table for Condition 1.5 to specify that the requirements apply to HAP emissions, refer to Condition 1.5 for emission factors and specify that performance testing is for formaldehyde. In addition, the text portion in Condition 1.5 was revised to include a list of emission factors for relevant HAPs.

- Revised the table for Condition 2.5 to specify that the requirements apply to HAP emissions, refer to Condition 2.5 for emission factors and specify that performance testing is for formaldehyde. In addition, the text portion in Condition 2.5 was revised to include a list of emission factors for relevant HAPs.

- Removed the requirement in Condition 7.1 to calculate HAP emissions from the emergency generator and fire pump engine, since HAP emissions from these units are very low and do not contribute significantly to HAP emissions. In addition, Condition 7.1 was revised to refer HAP calculations for the Plains End I and Plains End II engines to Conditions 1.5 and 2.5 of the permit and to clarify the compliance monitoring methods for individual and combined HAPs.

In addition, Plains End requested that the opacity monitoring language for the two diesel engines be revised to clarify the monitoring requirements. The changes to Conditions 3.5.3 through 3.5.8 and 4.5.3 through 4.5.8 were made as requested, except that language was added to indicate that if the engines are not operated during the annual period, no Method 9 readings are required.

Comments on the Draft Permit and Technical Review Document Received on October 24, 2011

The comments submitted on October 24, 2011 were minor in nature and primarily addressed typographical errors and changes to indicate the plant is located in “Arvada” rather than “Golden”.

Other Modifications

In addition to the requested modifications made by the source, the Division used this opportunity to include changes to make the permit more consistent with recently issued permits, include comments made by EPA on other Operating Permits, as well as correct errors or omissions identified during inspections and/or discrepancies identified during review of this modification.

The Division has made the following revisions, based on recent internal permit processing decisions and EPA comments on other permits, to the Plains End Generating Station Operating Permit with the source’s requested modifications.

Section II.1 Plains End I Engines (twenty (20) engines)

- Condition 1.1.1 was revised to correct the reference to another permit condition (the reference to Condition 1.4.1 was corrected to Condition 1.4.2).

- Based on EPA's Order regarding a petition on another Title V permit regarding recordkeeping for good engineering practices, the following changes were made to the permit:

    - Minor changes were made to the language in Condition 1.8.1 to address recordkeeping for good engineering practices.

    - Minor language changes were made to Condition 1.8.2.1 and it was renumbered as Condition 1.8.2.2 (due to the addition of a "new" Condition 1.8.2.1). "Old" Conditions 1.8.2.2 through 1.8.2.4 were reformatted under Condition 1.8.2.2, as Conditions 1.8.2.2.a through c.

- The Technical Review Document for the initial Title V permit indicated that proposed revisions to 40 CFR Part 63 Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines (hereafter referred to as the "RICE MACT") applied to these engines (page 8). Revisions to the RICE MACT to address existing engines at area sources were finalized and published in the Federal Register on August 20, 2010. The relevant RICE MACT requirements were included in the revised permit.

  The RICE MACT includes two compliance options, an outlet CO emission limitation and a percent CO reduction. During processing of the initial Title V permit, the source indicated that they did not have an appropriate inlet location from which to conduct representative sampling. Therefore, the Division has included the CO outlet emission limit as the compliance option. These engines are already equipped with oxidation catalysts and past performance testing indicates that the CO emission limitation can be met.

<u>Section II.2 Plains End II Engines (fourteen (14) engines)</u>

- Condition 2.1.1 was revised to correct the reference to another permit condition (the reference to Condition 2.4.1 was corrected to Condition 2.4.2).

- Condition 2.2.1 was revised to correct references to other permits conditions (the reference to Conditions 1.6 and 1.7 were corrected to Conditions 2.6 and 2.7).

- Based on EPA's Order regarding a petition on another Title V permit regarding recordkeeping for good engineering practices, the following changes were made to the permit:

    - Minor changes were made to the language in Condition 2.8.1 to address recordkeeping for good engineering practices.

    - Minor language changes were made to Condition 2.8.2.1 and it was renumbered as Condition 2.8.2.2 (due to the addition of a "new" Condition 2.8.2.1). "Old" Conditions 2.8.2.2 through 2.8.2.4 were reformatted under Condition 2.8.2.2, as Conditions 2.8.2.2.a through c.

Section II.3 and 4 – Diesel-Fired Engines

- Both of these engines commenced construction after June 12, 2006 and are considered "new" engines under the RICE MACT. Under the RICE MACT new engines located at area sources meet the requirements of the RICE MACT by meeting the requirements of 40 CFR Part 60 Subpart IIII (see § 63.6585(c)(1)). Therefore, the permit was revised to include these requirements.

- The SO_2 emission factor for the fire-pump engine (Section II.4) was revised to reflect the current fuel sulfur limit for this engine.

Section II.4 – NSPS Subpart IIII Provisions

- Condition 5.1.4 was removed since the lower fuel sulfur limit is now in effect.

Section IV – General Conditions

- General Condition 29 (VOC) was revised by reformatting and adding the provisions in Reg 7, Section III.C as paragraph e.

Appendices

- Changed the Division contact for reports in Appendix D.